

# Blenniid fishes from Godavari Estuary<sup>1</sup>

BY

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*(With five text-figures)*

The lower reaches of Godavari estuary, with a vast net-work of creeks, support a rich mangrove vegetation composed of species of *Avicennia*, *Excoecaria*, *Ceriops*, etc. Due to constant tidal action and the consequent erosion of the banks of creeks, the roots of these plants towards the water are generally exposed. Part of the stems and exposed roots were generally infested with wood boring organisms mainly *Teredo* and *Bankia* (Ganapati & Rao 1959). The extent of damage done in some cases is so great that the entire stem appears like a sieve, some of the holes measuring from about 300 mm to 500 mm in length and 5 mm to 50 mm in diameter. In the course of investigations on the fish fauna of these creeks, blenniids were observed for the first time to inhabit the bores vacated by molluscan borers (Dutt & Rao 1961). It is also possible that these blenniids might occupy the bores after eating away the original inhabitants. Prompted by this possibility, an extensive survey of all creeks in the estuary was carried out during which blenniids were collected from mangrove plants of all the creeks. It is interesting to note that these fishes, in spite of intensive search, could not be collected outside the mangrove plants in any part of the estuary.

Blenniids of Godavari estuary fall under two genera represented by five species. All the five have restricted gill openings (Smith 1959) and can be identified by the following key. (The new species is described in detail.)

## KEY FOR THE IDENTIFICATION OF GODAVARI BLENNIIDS

1. Gill openings entirely above pectoral base.....*Omobranchus* Swainson
  - (i) Lower canines twice the upper :
    - (a) Membrane from the last ray of dorsal and anal reaches base of caudal, 9-10 incomplete vertical bars on sides in upper half, 7-8 round spots along mid side, first dorsal edge black, no spots.....*O. bhattacharyae* (Chaud.)

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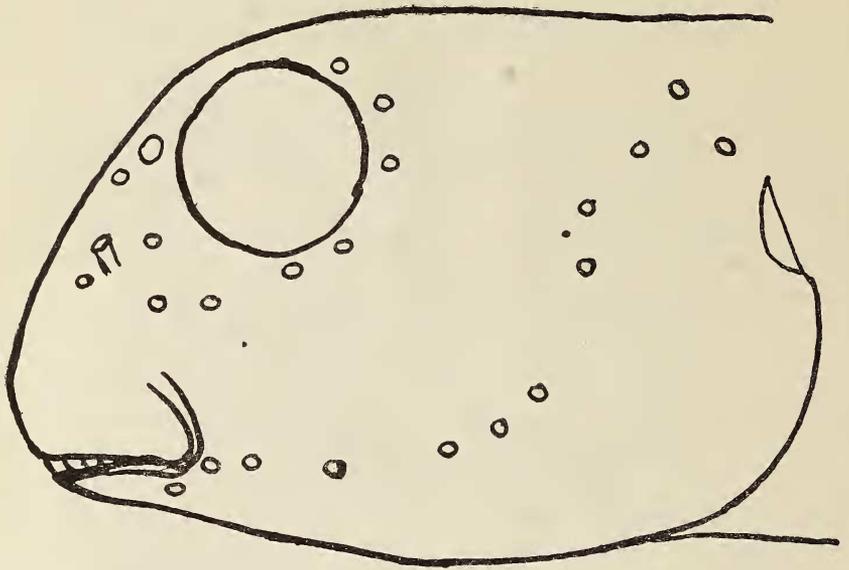
- (b) Membrane from the last ray of dorsal and anal does not reach caudal base, no markings on sides of body, two dark blotches on 1st dorsal ..... *O. bipunctatus* (Day)
  - (ii) Lower canines about  $1\frac{1}{2}$  the upper : Upper half of sides with about 11 broken vertical bands, horizontal lines in the lower half, a dark band along the middle of entire dorsal, a black spot of the size of eye above gill openings ..... *O. japonicus* (Bleeker)
2. Lower edge of gill openings opposite pectoral base ..... *Cruantus* Smith
- (i) Ventral much shorter than head ; males with a crest and tentacle on head, sides with 9-10 dark vertical bands, horse-shoe-shaped black ring behind eye, a dark oblique blotch anteriorly on first dorsal. .... *C. smithi* sp. nov.
  - (ii) Ventrals as long as head : no crest and tentacle on head, a short white and black band behind eye, sides with a double row of spots below base of dorsal and a single row along middle, a round black spot posteriorly on dorsal in males. .... *C. dealmeida* (Smith)

Some features are common to all the five species. The presence of pores and their arrangement on snout, around eye and from above gill openings to lower jaw across the preopercular margin is more or less same (Fig. 1, A, B.). All the species exhibit sexual dimorphism in the nature of anal fin rays, the tips of which in males develop fleshy spade-like expansions mounted on fleshy bases (Fig. 4, B). This modification becomes apparent in maturing males being more pronounced in fully mature specimens. The anal papilla is very well developed in females while it is simple in males (Fig. 4, A, C) ; the first and shortest anal ray is attached to the anal papilla and appears as if extending out of it in females while it is free from the anal papilla in males. The shape and arrangement of teeth is same in all the species. All the species have dark vertical bands on head, however, the number and position of these bands vary from species to species. There are downward flaps on both lips at the corners of mouth in all the species, those on the upper jaw covering the junction of both lips.

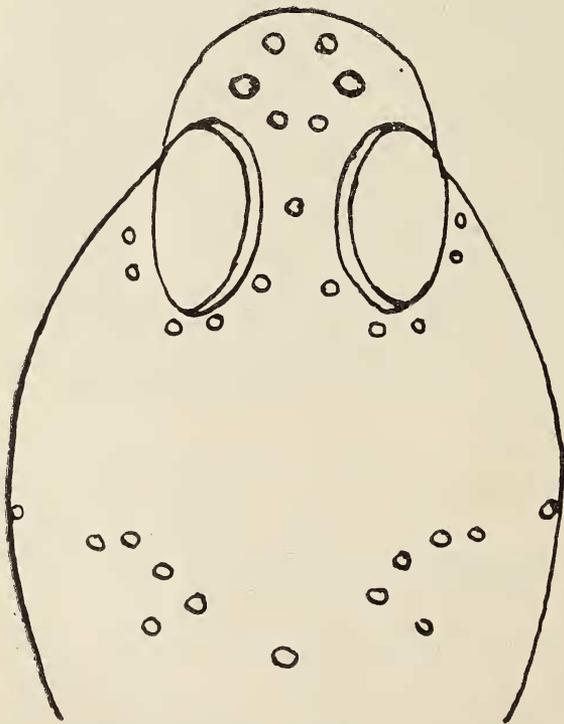
***Omobranchus bhattacharyae* (Chaud.)**

Many specimens ranging from 20 mm to 72 mm total length.

This species occurs in good numbers in the mangroves of the lower reaches and is rarely found in the middle reaches.



A



B

FIG. 1. A. Lateral view, and B. dorsal view of the head of blenniid showing the arrangement of pores on head.

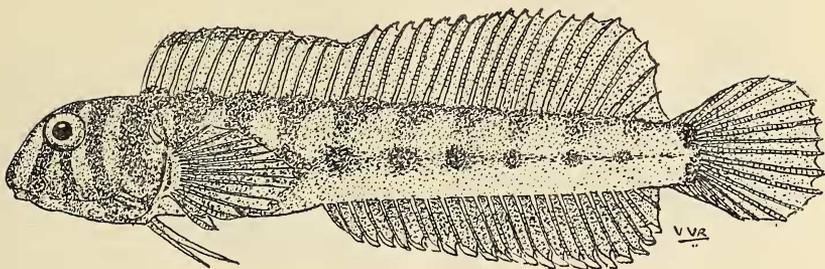


FIG. 2. *Omobranchus bhattacharyae* (Chaud.), male, total length 65 mm.

***Omobranchus bipunctatus* (Day)**

Only two specimens (51 and 65 mm in total length) could be collected during the course of the investigations.

***Omobranchus japonicus* (Bleeker)**

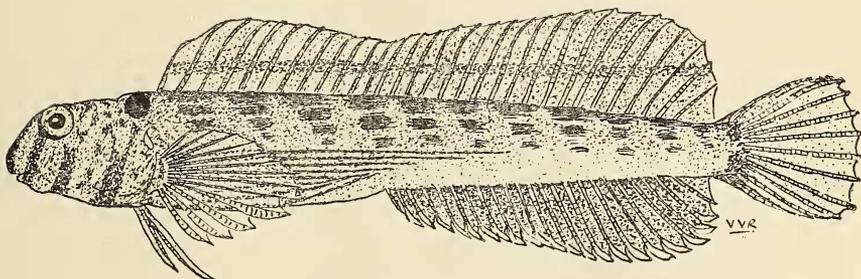


FIG. 3. *Omobranchus japonicus* (Bleeker), male, total length 67 mm.

This species (34 to 70 mm in total length) occurs in considerable numbers in the estuary but is restricted to creeks nearer to sea.

***Cruantus smithi* sp. nov.**

*Holotype* : Male, 65 mm standard length.

*Paratypes* : Two males, 46.5 mm and 52 mm and two females 49 mm and 40 mm standard lengths. Specimens deposited in the Zoology Museum, Andhra University, Visakhapatnam.

*Description* : Based on many specimens ranging from 27 mm to 75 mm total length.

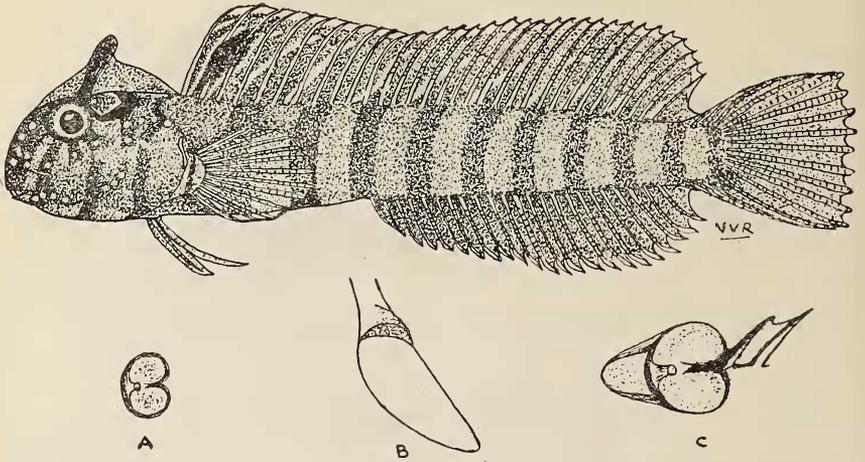


FIG. 4. *Cruantus smithi* sp. nov. type, male, total length 75 mm and enlarged views of A. anal papilla of male, B. tip of anal ray of male showing the spade-like expansion mounted on a fleshy base and C. anal papilla of female showing the nature of attachment of the first anal ray.

D 31-32 ; A 23-24 ; V 1+2 ; P 13 ; C 13 ; GR 2.6 ; Vert. 10-11 + 26-28.

Head bulky, body elongated gradually narrowing to caudal base. Depth 5.2-6.0, head 3.5-4.5 in standard length. Eye 3.0-4.0 in head, snout slightly rounded, a little less than eye. Males with a semicircular crest on head from before eye to dorsal origin with a tentacle in it above eye which is more than orbit. Downward flaps on both lips at the corners of mouth. Each jaw with 18 teeth, lower canines one and half the upper. Pores on snout, around orbit and from gill opening to lower jaw across preopercular margin. Lateral line as a faint groove, bends below 9th dorsal spine, continues to caudal base along mid side. Anal papilla well developed in females.

Dorsal origin above gill openings, margin slightly concave in the middle, otherwise spines and rays of same height which is equal to depth. Anal origin below 11th dorsal spine, more or less equi-distant from snout tip and caudal base, first two rays short, rest gradually increase in length posteriorly, height two-thirds in depth. Ventral a little less than two-thirds in head, split at half the length, outer ray one-fourth smaller than the inner. Pectoral less than three-fourths in head. Tips of anal rays spade-like in males. Membrane from the last ray of dorsal and anal joined to caudal base. Head and body pink to violet in males and pinkish yellow in females and juveniles, head and anterior third of body being darker. Males when agitated or kept against a dark background attain deep violet colour. Light blue spots on head corresponding to pores. Snout dark, a horse-shoe-shaped black ring of about

the size of orbit behind eye on either side. Three dark violet bands radiate from the lower margin of orbit, the 1st passes down the corner of mouth to lower jaw, 2nd and 3rd extend only to upper third of preopercle. Two bands one from preopercle and the other from opercle to ventral side of head, both meet bands from opposite side below, a short band from below posterior part of the horse-shoe-shaped ring behind which is somewhat curved band extending from above the band on opercle to dorsal origin. Crest on head light violet, tentacle dark violet to black. Sides with 9-10 dark violet bands, slightly narrower than the ground colour, these bands are lighter in females and juveniles. Dorsal and anal violet, the latter much darker, the former with a dark violet blotch obliquely across 2nd and 3rd spines and about 12-13 irregular white streaks on the entire fin, entire free margin of dorsal bright yellow. Pectoral, ventral and caudal pale yellow, a dark band on pectoral base. Tips of anal rays pale.

A comparative account of the new species and the other two known species of *Cruantus*, *C. dealmeida* and *C. petersi* (Kossmann & Rauber) (Smith 1959) is given below.

	<i>C. smithi</i>	<i>C. dealmeida</i>	<i>C. petersi</i>
<i>St. length</i>			
Depth	5.2-6.0	5.1-5.5	5.7
<i>St. length</i>			
Head lth.	3.5-4.5	4.2-4.5	4.5
<i>Head lth.</i>			
Eye	3.0-4.0	2.8-3.5	4.0
Gill opening :	To upper part of pectoral base	To upper part of pectoral base	Over almost whole pectoral base
Teeth in each jaw	18	18	30
Pelvic fins :	Shorter than head	Equal to head	Shorter than head
	Dorsal and anal joined to caudal base	Dorsal and anal joined to caudal base	Dorsal and anal joined to caudal peduncle

Apart from the abovementioned differences *C. petersi* also differs from the other two species in the colour pattern which is according to Smith (1959) : 'Blue white, scattered deep blue spots. Black stripe along back from snout, tapers to caudal. On 13-17th anal rays an oval white spot, other fins colourless.' The presence of crest with a tentacle on head in males and the characteristic coloration distinguishes the new species.

The new species is named after late Prof. J. L. B. Smith who has contributed much to our knowledge on the blennioid fishes.

This species is very widely distributed among the creeks of Godavari estuary and occurs in moderate numbers even in the middle reaches of the estuary.

***Cruantus dealmeida* (Smith)**

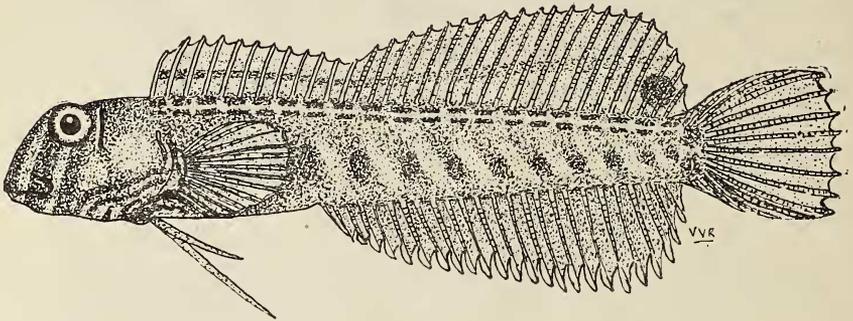


FIG. 5. *Cruantus dealmeida* (Smith), male, total length 54 mm.

Many specimens ranging from 20 mm to 60 mm total length.

Outside India it has been recorded only from Ponte Maeone, Delagoa Bay, South Africa (Smith 1959). The Godavari specimens slightly differ from the South African specimens in the nature of coloration. The black spot at the end of dorsal fin is restricted only to males. Smith (1959) has not mentioned any such sexual specificity of this character, probably because his description is based only on two specimens.

The species is the most widely distributed, occurring in good numbers in the lower reaches as well as in the middle reaches of the estuary.

*Habitat*: As stated earlier, Godavari estuarine blenniids inhabit mangrove stems and roots exclusively and are not found elsewhere. They occupy the stems and roots at the level of high water mark in relatively higher numbers than those at the low water mark. The stems and roots at the entrance of creeks are occupied in greater numbers than those in the interior. In a few instances they also inhabited dead and decaying stems jutting out 15 to 30 mm above the mud. In each case, juveniles always occupied the upper part of the stem and adults were found deeper down. Each long bore with several interconnected small bores is occupied by many fish, always belonging to the same species, thus, showing species segregation. Few experiments carried out did not indicate any homing instinct among these fish. Whenever they were removed from the bores and placed on mud they used to crawl

back to the nearest stem or root and enter the bore. In no case were they observed to make any attempt to return to the original stem or root they inhabited.

The fish are more abundant in creeks nearer to sea, and their frequency gradually decreases up river. However, they were also seen on mangrove stems of creeks where the salinity varies from about 2‰ to 33.5‰ during different seasons. In one creek which is about 15 km away from the sea (the maximum distance at which these fishes were collected) where the salinity drops down to zero now and then due to fresh water drainage from the adjacent irrigation fields, these blenniids, especially *C. smithi*, were not only found to be unaffected by this fluctuation in salinity, but also bred in the bores. This clearly shows that these fishes are capable of tolerating wide fluctuations in hydrological conditions and, the decrease in their numbers from sea up the river is perhaps to be attributed to the sparse distribution of mangrove plants in the middle and upper reaches of the estuary.

It is difficult to say what happens to these fishes during the flood season (July to August) when the sea water in the entire estuary is replaced by flood waters. As stated above, these fishes generally occupy the roots and stems at the level of high water mark which are not likely to be submerged for a prolonged period by the flood waters; it is likely, therefore, that they remain unaffected by the rise in water level or might crawl further up inside the bores. The fact that the stems and roots examined soon after the flood period, when it was possible to reach the creeks, were occupied by these fishes suggests that they do not leave the bores even during flood period.

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#### REFERENCES

- DUTT, S. & RAO, VISWESWARA, V. (1961) : On the breeding habits and early developmental stages of *Petroscirtes bipunctatus* Day. *J. Zool. Soc. India* **12** : 158-161.
- GANAPATI, P. N. & RAO, M. V. LAKSHMANA (1959) : Incidence of marine borers in the mangroves of the Godavari Estuary. *Curr. Sci.* **28** : 332.
- SMITH, J. L. B. (1959) : Fishes of the families Blenniidae and Salariidae of the Western Indian Ocean. *Rhodes Univ. Ichth. Bull.* **14** : 229-252.